Big Bend Village — *By E. M. Schiwetz*

The HUMBLE WAY

MARCH-APRIL, 1948

SALES TRAINING INCREASES SALE
SUGGESTIONS
COMING SOON
CHAMPION
SALES-BY-SET CONTEST

The HUMBLE WAY

Vol. III MARCH-APRIL 1948 No. 6

$140 MILLION INVESTMENT IN '48

Earlier Large Reinvestment Basis of Proposed Increase in Capital Stock

INVESTMENT of substantial amounts of capital each year is necessary to maintain job stability for more than 18,000 men and women employed by the Humble Companies. For that reason, Humble's recent announcement that it plans to invest $140,000,000 in new facilities in 1948, if sufficient steel and other materials can be secured, is news of vital importance to all employees. Such investment is likewise the basis of future earnings, and is therefore equally a matter of importance to stockholders.

The major part of the planned investment will be in new wells to produce more oil and in plants to conserve natural gas. The new investments already planned are $110,000,000 in production, $16,000,000 for refining, $7,500,000 for pipe line facilities, and $6,500,000 for other purposes.

It will cost about $65,000,000 to drill the 738 wells scheduled by the Company this year. This is the most expensive drilling program in Humble's history, and calls for 163 more wells than were drilled last year. About one third of the expenditures are planned for drilling wildcat wells in the search for new oil fields; the balance will be spent to develop production in proved areas.

As part of its program of exploration, the Company plans to drill a number of wells in the Gulf of Mexico. Drilling on these submerged lands is difficult and costly, but the high level of demand makes it mandatory that this area on the continental shelf be explored promptly.

New units for the conservation and utilization of gas to be constructed by Humble this year include natural gasoline plants at Conroe and Pickton in Texas and Opelousas in Louisiana, and gas injection plants in the Seeligson and Kelsey fields in Southwest Texas. These injection plants will return gas to the underground reservoirs where it will be available for future use. The Seeligson plant will ultimately be developed into a gasoline plant.

These five plants involve an estimated total investment of $22,405,000, of which approximately $11,837,000 will be spent in 1948. The three gasoline plants will handle about 148,000,000 cubic feet of gas daily, from which about 4810 barrels of liquid products will be derived. The two gas injection plants will save about 38,000,000 cubic feet of gas a day.

Among the major items of expansion at Baytown refinery this year are: Pipe Still No. 4, with a capacity of 45,000 barrels of crude oil a day; Phenol Plant No. 2, for improvement of lube oils; additional dock facilities to provide berths for two more tankers; and a program for expansion and improvement of the shops necessary for mechanical repairs and maintenance. A research building and additional power and steam generating facilities are also planned.

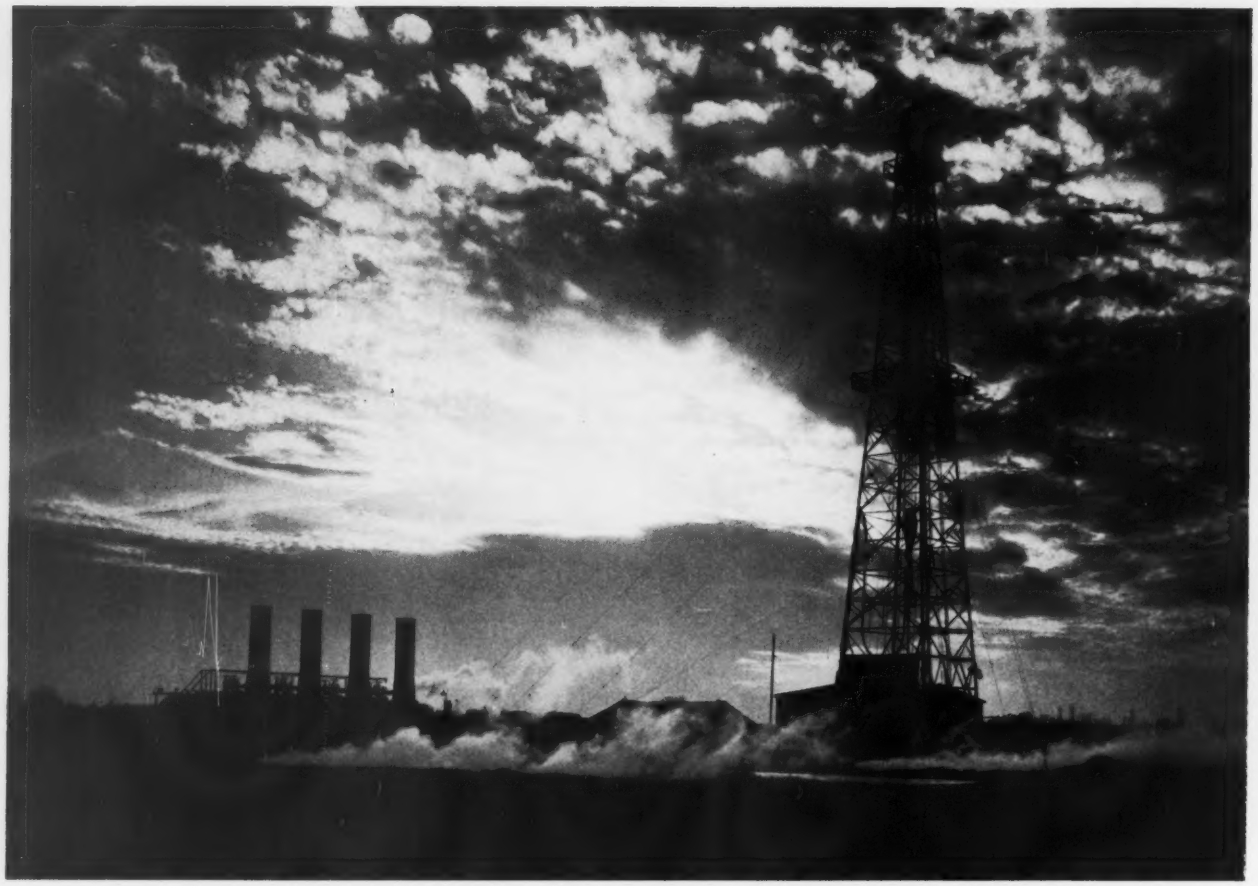
Humble Pipe Line Company plans to spend about $2,800,000 for improving its pump stations. Approximately $1,250,000 will be spent in laying loops and in extending and improving main lines. About $2,000,000 will be invested in smaller lines to gather oil from wells.

The Sales Department expects to invest about $6,000,000 in additions, improvements, and new construction on service stations, bulk stations, and other facilities.

The program of investment planned for 1948 is in keeping with Humble's traditional policy of investing a substantial part of its earnings in addition to the normal replacement to make up for depreciation and depletion of its properties. This policy has increased Humble's net book investment in fixed assets to more than $480,000,000. So that capital stock may represent more nearly the net book investment in fixed assets, the Directors are recommending to the stockholders that capital stock be increased from $300,000,000 to $475,000,000 by action at the annual meeting on May 10.

This increase of $175,000,000 in capital stock will reflect the fact that Humble has reinvested in fixed assets the major part of earnings retained in the business. The proposed capitalization of $475,000,000 is considered conservative and more realistic than the present capitalization. The Directors will not recommend any change in the number of shares of stock.

SALES TRAINING is brought to more than 5,000 people engaged in selling Humble products through films, literature, demonstration and discussion in training meetings.



DAY IS NEVER DONE ON A DRILLING RIG. AS THE SUN SINKS LOW HUMBLE'S RIG NO. 5 CONTINUES DRILLING.

A Day on a Rig

TOOL PUSHER and driller discuss operations.

A DAY on a rig is a full 24-hour day, with every moment directed toward keeping the bit rotating on the bottom "making hole." Night and day, drilling crews work in all kinds of weather to put wells down in the shortest possible time.

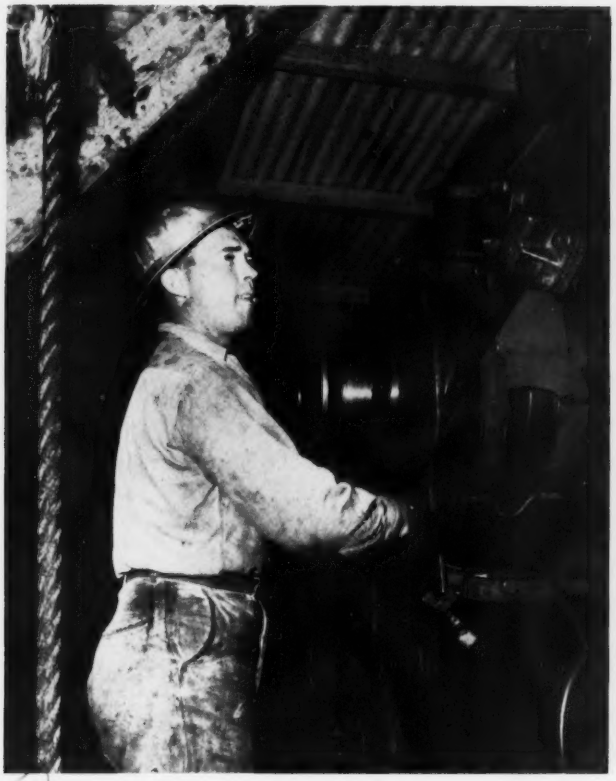
To achieve speed and efficiency, the drilling crew must operate as a team, combining all their experience, skill and ability in handling heavy drilling equipment. Timing and coordination are all-important. Roughnecks on the floor and the derrickman high "upstairs" work smoothly with the driller as he controls the giant traveling block while "making a trip," and in every other job around the rig.

The men on these pages are just such a drilling team; they are members of the crew of Humble's Rig No. 5, now drilling a field wildcat on the edge of the Raccoon Bend field, between Bellville and Hempstead, Texas. They are much like the men on the other rigs from New Mexico to Florida who are drilling the 738 wells projected in the Humble Company's $65 million 1948 program.

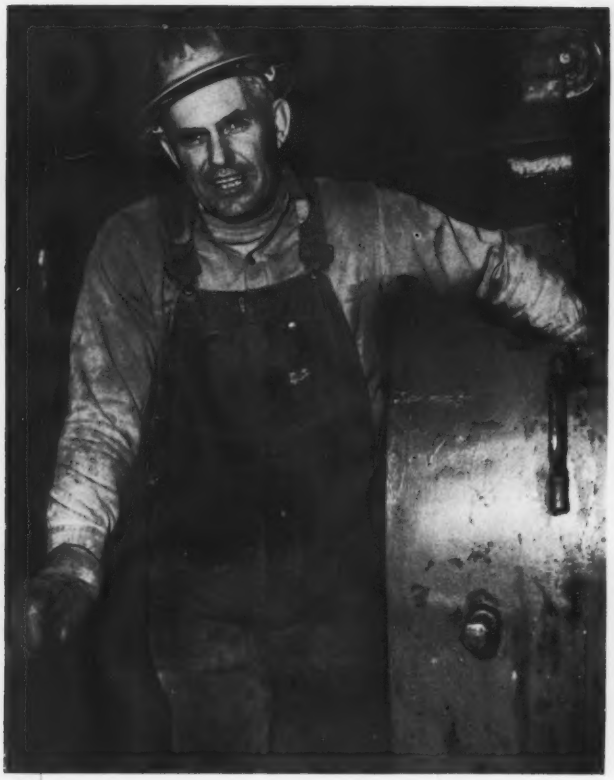
The crew that keeps Rig No. 5 running is divided into four tours (pronounced towers); Morning Tour, from midnight to 8 a.m.; Day Tour, from 8 a.m. to 4 p.m.; Evening Tour, from 4 p.m. to midnight; and the Relief Tour.

Since Rig No. 5 is a heavy steam rig, each tour consists of driller, derrickman, fireman, and two roughnecks. The latter are officially termed rotary helpers, a title reserved almost exclusively for the time sheet. The whole rig is under the supervision of the tool pusher, who spends most of his days and many night hours insuring proper operation of the rig.

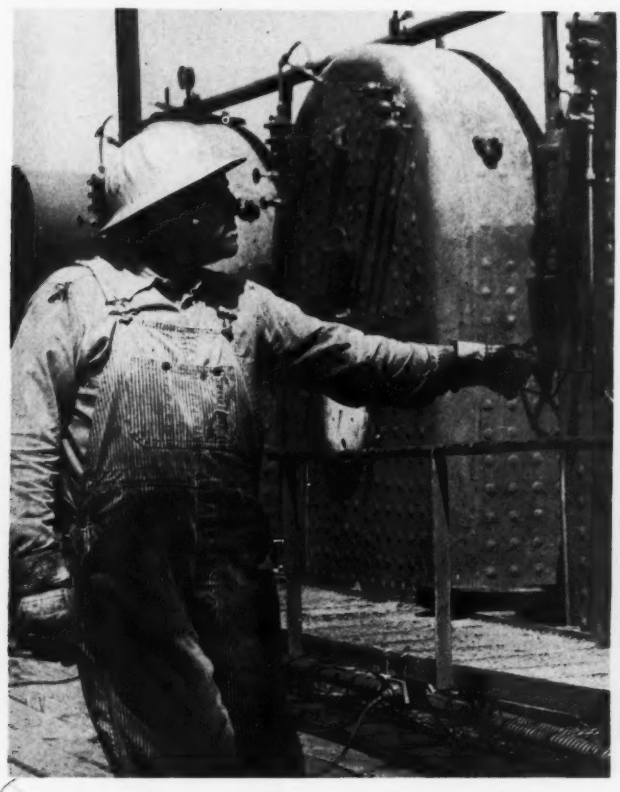
Because bits become dulled, and pumps and engines require repairs, every minute of every day cannot be spent making hole; round trips and rig maintenance consume much of the time it requires to drill a well. On these and the following pages are pictured some of the jobs members of a full drilling crew perform during a 24-hour day.



1. ROUGHNECK handles "cat line" in picking up heavy equipment as other roughneck guides material onto derrick floor.

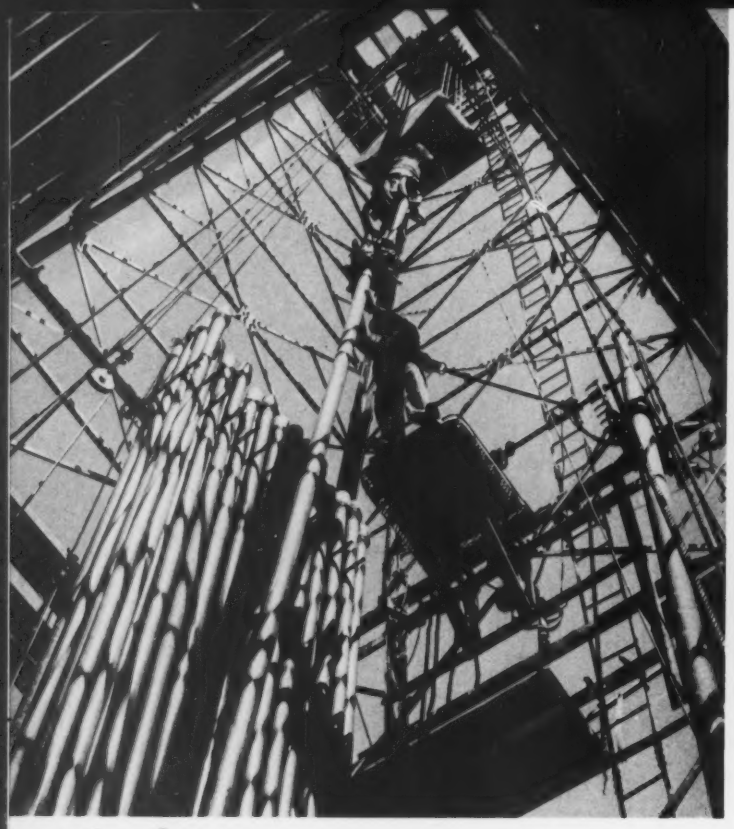


2. DRILLER feels brake drum with left hand as he slacks off with his right, making hole during the early morning darkness.



3. FIREMAN blows down boiler to maintain proper water level. Four boilers supply 500 horsepower for engine and pumps.

4. DERRICKMAN on evening tour checks mud viscosity with stop-watch. Close control of mud and pumps is derrickman's job.



5. NINETY FEET above floor, derrickman steadies a thribble while going in the hole; other thribbles are racked in hayrake.

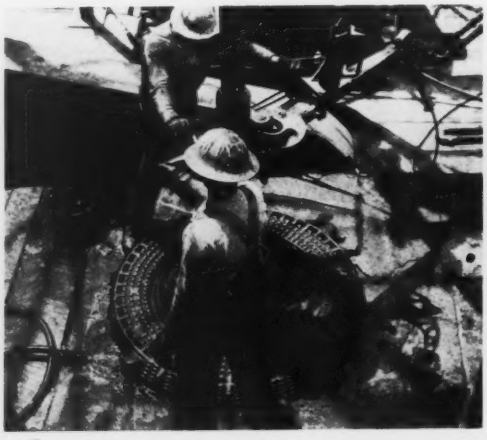
6. LOOKING DOWN past derrickman to derrick floor; safety band and shoulder harness help steady derrickman on the monkey board.

687
A46
772

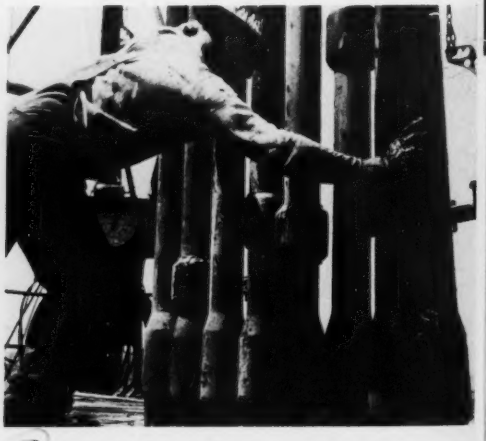
Round Trip

When the bit must be changed, a survey made, or a desired depth is attained, drilling ceases until a round trip is made. The drill pipe is pulled out of the hole and racked in 90-foot thribbles, or stands, in the derrick. When the new bit or tool is returned

7. REACHING for elevators descending to pick up the drill pipe.



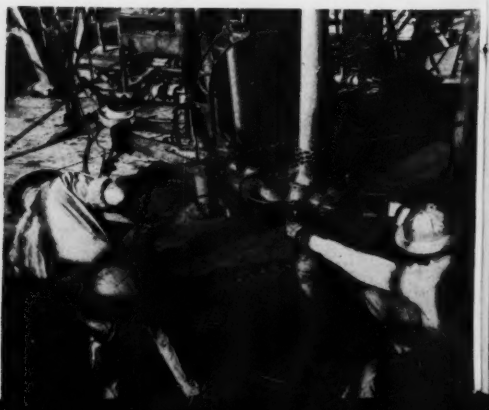
8. COMING OUT of the hole, roughnecks set tongs as the rotary spins, unscrewing a 90-foot thribble.



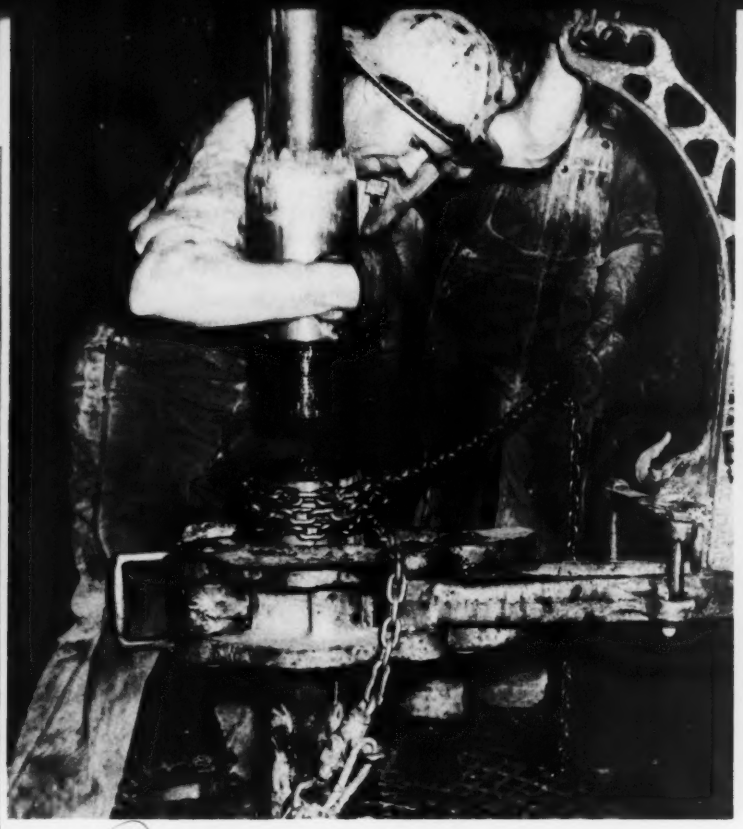
9. THRIBBLES are racked on the derrick floor in rows of fourteen.

10. OUT OF the hole, roughneck prepares to make up a new rock bit.

11. DRILLER wears glasses to combat the sun as he looks up into the derrick while going in the hole.



12. GOING IN the hole, spinning chain screws, tongs tighten each thribble.



13. STABBING a thribble while going in the hole requires a strong shoulder. The other roughneck stands ready with the spinning chain.

14. DRILLER controls tension of spinning chain as a thribble is screwed up. Tongs are set to provide the final tightening.

to bottom, the round trip is complete. Handling the heavy counterbalanced tongs, the spinning chain, and the elevators requires split-second timing on the part of every man. Every movement, on the floor and high in the derrick, must be coordinated with the movement of the big traveling block. There is no day or night on the bottom, and trips are made at any hour in any weather.

15. MORNING TOUR DRILLER KEEPS A LONELY VIGIL ON THE BRAKE AS HE DRILLS AHEAD WITH A NEW BIT

BREAXIT IS ADDED TO OIL SAMPLES WHICH ARE WHIRLED IN HIGH SPEED CENTRIFUGE TO SEPARATE WATER FROM OIL.

OIL AND WATER DON'T MIX

But they do form emulsions which must be broken before the oil is accepted for pipe line delivery

IT IS a far cry from the cud-chewing Jerseys and Holsteins in a dairyman's barn to the oil industry. But the dairyman's stock in trade is one of the oil man's vexatious problems. Both are emulsions of oil and water. Milk is an emulsion of oil *in water* and butter is an emulsion of water *in oil*. Both types of emulsions are found in the oil fields (with numerous complex deviations from them) and wherever they are found, they pose problems for the oil industry. "Pipe line oil," so called, must contain not more than one per cent of basic sediment and water, and the emulsions from oil wells may be 15 per cent to 80 per cent water. Imagine the waste involved in transporting so much water from West Texas to the Gulf Coast, and the danger of introducing it to distillation equipment operating at 600° Fahrenheit.

But what is an emulsion? It's not enough to say that milk is an emulsion—the scientist must know what an emulsion *is*. As good a definition as any is found in the dictionary: "A suspension of fine globules . . . in a liquid." Magnify one of the fine globules to a comparatively enormous size, and you'll

discover that the liquid surrounds and contains it like an egg shell, and to break the emulsion you must break this liquid shell.

The oil industry's problem becomes, then, one of breaking the shell to release the oil, or water, that is the egg. Once the shell is broken, the oil rises, the water, being heavier, sinks, and the one can be drawn off the top of the container in which the emulsion is broken, the other off the bottom. The agents used to break such emulsions are called emulsion-breakers; and Humble's trade-mark name for a complete line of such compounds is Breaxit.

So, though oil and water, according to popular fancy, won't mix, they do form emulsions with each other; and even before the modern oil industry got its start at Spindletop, the breaking of these emulsions to get the oil and get rid of the water had required the thought and skill of oil men.

Early History

The first patent on an emulsion breaker, issued to a Californian, is dated 1892. Prior to that time, production had been so limited and had come from such shallow wells, that there was little difficulty with emulsions, and that little was handled by letting the oil remain in storage until the emulsions broke themselves.

But as production climbed and wells went deeper, the need for emulsion breakers grew. Most frequently, oil men added woodashes and lye, the same chemicals a frontier mother used when she made soap in an iron kettle. "Hay tanks" were also used, and to some extent still are. In these, hay or excelsior is first wetted with oil; the emulsion is passed through the wet mass and because it is wet with one of the ingredients of the emulsion, it tends, by one of the laws of physical chemistry, to separate that ingredient from the other.

All these measures, and there were dozens of them, sufficed as long as the pipe lines would accept oil with as much as five per cent and higher, of basic sediment and water, and refinery temperatures were such that this percentage was not hazardous. But as scientists developed new refinery techniques that utilized higher temperatures to obtain more products from crude oil, the specifications for pipe line oil became more strict. A better emulsion breaker had to be devised, and in many places an electrolytic process was instituted. It was fairly efficient. The oil from gathering lines was stored at some central place where it was processed in a special apparatus by passing a high voltage between electrodes immersed in the emulsion; then, after drawing off the water, the oil was pumped into the line. The limitations of this process were the absence of electricity in many areas, the difficulty of handling thick, buttery emulsions through the gathering lines, the necessity for extra storage at the place where the emulsion was broken, and the heavy expense of installing the apparatus and operating it.

Difficulties Were Many

These difficulties stimulated the development of chemical processes, or rather, their improvement, for the woodashes and lye of the old-timers were, when all's said, chemical emulsion breakers. The chemicals, made to fixed formulas, worked fine in some fields; in others, they had no effect except sometimes they made the emulsion worse. The chemists finally began to realize that every emulsion poses a special problem—no two are alike, often in the same field.

It was about this time that Baytown refinery began to experience difficulties with emulsions in the recovery of oil after the "acid treat" of its lubricating oils. Without going into technical details, suffice it to say that too high a percentage of the oil passing through the lube plant was being discarded as waste because of emulsions that couldn't be

WHEN PROBLEMS ARISE in the field, engineers who are treating specialists come equipped with many different kinds of Breaxit. Oil is tested with many compounds until best one is found.

broken. Dr. Stewart Coleman, now with Standard Oil Co. (NJ), was at the time at Baytown. He conceived the idea of using "sludge soap" (secured by neutralizing the acidic sludge resulting from the acid treat of lubricating oils) as an emulsion breaker. It worked so well at the refinery that Dr. Coleman was prompted to try it in the field. The experiment was encouraging; the sludge soap broke some of the field emulsions, but it contained considerable quantities of asphalt, and in the field the "soap" hardened to where it was impractical to use.

When Mr. Coleman left Baytown, Frank Goss, now assistant general superintendent at Baytown refinery, was given the emulsion breaker assignment. He thought of removing the asphalt by successive acid treatments of the oil. The new process (and he ran the first batch of it by himself, around the clock) solved the refinery problem of that day by cutting the waste in half, and gave the Company an acidic emulsion breaker to try out in the oil fields.

This was in 1926. Mr. Goss first tried the new product on the emulsions of the Goose Creek field. It worked. He went on to Barber's Hill, Sour Lake and other coastal fields. The emulsion breaker, being acidic, had to be handled with more than ordinary care, and it was hard on shoes and clothing, but it continued to give good results. Nevertheless, Mr. Goss, with a scientist's pertinacity, was still not satisfied. He asked a friend in another oil company to let him try to break the toughest emulsion the company produced. The result was a visit to Oklahoma and introduction to an emulsion that was so thick it looked like mayonnaise, and so tough to break that it had defied every chemical emulsion breaker on the market.

PETROLEUM ENGINEER checks the Breaxit injection system on a treater serving a battery of production lease tanks. On the ground at the left is a miniature model of one type of treater.

Disappointment, Then Success

The first try was disappointing. The emulsion breaking compound that had worked so well on coastal crudes was ineffectual. But Mr. Goss didn't leave. He studied the emulsion, and he talked with the production men on the job, with the hope that he might pick up a stray bit of helpful information. Almost by chance, he learned that a common cleaning powder that could be bought at any grocery was effective in removing the emulsion from dirty hands. With this tip in mind, Mr. Goss left for town.

He added the basic ingredient of the cleaning powder to the emulsion-breaking compound and went back to the field. He placed the new compound in the casing heads one midnight. Next morning, when he returned to the lease, he was met by an excited superintendent. The man was getting pipe line oil from the wells for the first time in the history of the lease, and he wanted a carload of the emusion breaker!

It would be pleasant to report that Oklahoma incident as the dramatic birth of a revolutionary new product in the oil industry. But scientific advances are not often made overnight. The significance of the Oklahoma experiment is this: it demonstrated that special emulsion breakers would be necessary to meet the needs of the industry, that research must be carried from laboratory to field, that research must be continuous in the field, and that Humble could successfully manufacture an emulsion breaker whose basic ingredient was a petroleum product.

Breaxit is Born

There followed a period of more intensive testing, of comparison with competitive products, of patent investigations, of management discussions on the advisability of adding a new product to the Humble line. The Production Department was active in all the investigations and detailed a petroleum engineer to collaborate with the Research and Development department at Baytown. Competitors tested their products against

(Continued on Page 22)

TOWERING CASA GRANDE, 7300 feet high, stands eternal guard over the tourist cabins in The Basin, Big Bend National Park headquarters in the Chisos Mountains.

Can this be Texas?

"CAN this be Texas?" the vacationer asks.

Standing on a mountain ridge, more than a mile high, he stares with awe at naked, savage peaks above him. He almost tastes the sharp mountain air and feels nature's silence.

Encircled by volcanic heights, he sees the outside world only through The Window, a gap between mountains. Four thousand feet below lies a vast semi-arid plain and lesser mountains.

This primeval place, he thinks, is remote from civilization, its weakness and its vanity.

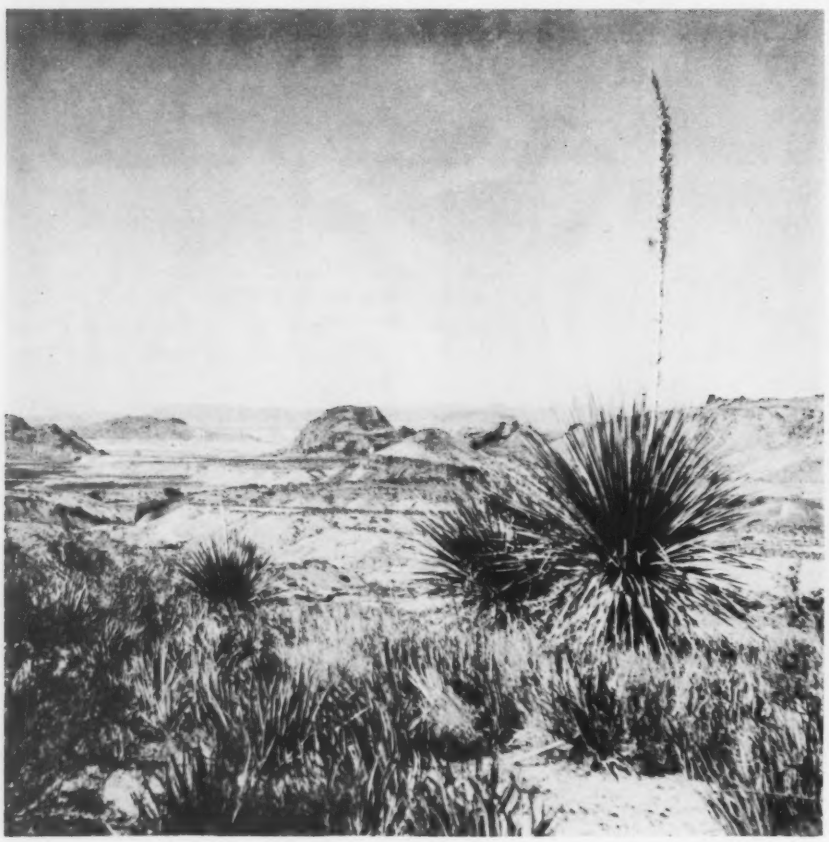
But he wonders aloud: "Can this Shangri-La be Texas, state of cowboys, cattle, and oil wells?"

Yes, it is Texas, but a part little known and perhaps more typical of Mexico than of the Lone Star State.

The vacationer stands in the Chisos Mountains in rugged Big Bend National Park — 707,895 acres of Texas land lying along the Rio Grande, international boundary between the U. S. and Mexico, where it makes a sweeping U-shaped bend in its course.

Roads Are Unpaved

Once an Indian hunting ground and border hideout for bandits and cattle rustlers, the area is now in the early stages of development as America's sixth largest national park. Roads are not paved and accommodations are meager, but the scenery, from parching flats to



jutting mountains, is unsurpassed for contrasts.

Roads into the park originate at Marathon and Alpine on U. S. Highway No. 90. From Marathon the distance to park headquarters in the Chisos Mountains is 80 miles, and the first 40 miles of road is paved. The first five of the 118 miles from Alpine to headquarters via Terlingua is paved.

Soon after leaving Marathon, driving south, the Big Bend visitor comes upon the low and narrow Santiago mountain range, which parallels the road to the right. An armor-like rock ridge exposed along the backs of these mountains gives them an appearance of crouching dinosaurs, which geologists say inhabited prehistoric swamps in this area.

The Santiagos curve southeastward across the road about 40 miles from Marathon, and Persimmon Gap affords passage through them into the park proper. Near the first park ranger station, a pair of ruts leaves the highway and winds through brush and mesquite trees toward a narrow gash in the mountain range, now to the left. This is Dog Canyon, carved by the waters of Nine Point and Bone Spring Draws. The deep canyon marks the end of the Santiago range and the beginning of the Dead Horse Mountains, which stretch toward Mexico as far as the eye can see.

Strange Names and Tales

What strange names these mountains and gorges have, the visitor probably muses. He is soon to learn equally strange and interesting tales behind many of those names, like Dead Horse Mountains, for instance.

In the 1880's, the story goes, two Mexican bandits whipped their caballos across the flats and into these mountains—barely ahead of pursuing Texas Rangers.

Desperately seeking cover, the outlaws abandoned their horses and lost themselves among the boulders and canyons.

But the Rangers had vengeance—of a kind. Pistols roared, the two horses fell, and their masters were stranded, miles from food or water. Thus the range became known as the Dead Horse Mountains.

THE CHISOS, top, form a magnificent backdrop for the winding road and desert vegetation near Hot Springs. Yucca plants, cacti, and creosote bushes, below, defy nature to thrive in Rough and Ready Draw, near the road to Santa Elena Canyon.

Improvements Planned

The Big Bend park was authorized by act of Congress June 20, 1935. Its establishment on June 12, 1944, was made possible by the State of Texas, which appropriated $1,500,000 for purchase of the lands. The park is still in the early stages of development, but future plans include 100 miles of high-standard road, a system of foot trails, and minor roads to outlying areas.

A modern tourist lodge, saddle horse concession, and post office are planned for The Basin, as well as a similar development on the Rio Grande. Improvements will be made as rapidly as appropriations permit, park authorities say. The Mexican government is planning establishment of an adjoining Mexican national park south of the border.

An impressive vista unfolds as the tourist moves deeper into the park. Far ahead, rising from the eroded park floor, are the hazy spires and battlements of the Chisos Mountains, now purest blue, now becoming purple as the sun moves westward. These high mountains command almost the entire park scene, towering above the lower ranges the tourist is passing.

Wasteland Flowers Brilliant

The landscape changes now, for the road enters a scorched wasteland called Tornillo Flat, the bed of an ancient sea. His mouth dry, the traveler sees only the scrubby creosote bush, yucca or Spanish dagger, and many species of cacti. How they exist here he cannot imagine, but in spring the cacti bloom brilliantly in crimson, yellow, and purple; and Spanish daggers send up long stalks loaded with white blossom-clusters.

The blue Chisos begin to loom closer, appearing ever higher. To the west are the Rosillos Mountains, Christmas Mountains, and Paint Gap Hills, all rose colored rock and soil. Spectacular Sierra del Carmen Bluff, 30 miles to the southeast in Mexico, flashes red, purple, and black in the sun. Its color-banded heights are clearly visible from the foot of the Chisos, where the vacationer may pause, sigh, and cease to be amazed at the extreme contrasts of the Big Bend scene.

The road climbs steeply into the mountains, passing up Green Gulch between Pulliam Mountain and sharp Lost

(continued on Page 14)

ADOBE BUILDINGS of Terlingua, deserted mining town, slowly crumble to dust.

CHISOS PEAKS are barren, savage rock. Pulliam Mt., right; Casa Grande, center.

BIG BEND VISITORS pause on the road up Green Gulch to admire winter snow.

BEST ACCOMMODATIONS in the park are four stone cottages overlooking The Basin. The remaining 16 tourist cabins in The Basin are converted plywood Army hutments.

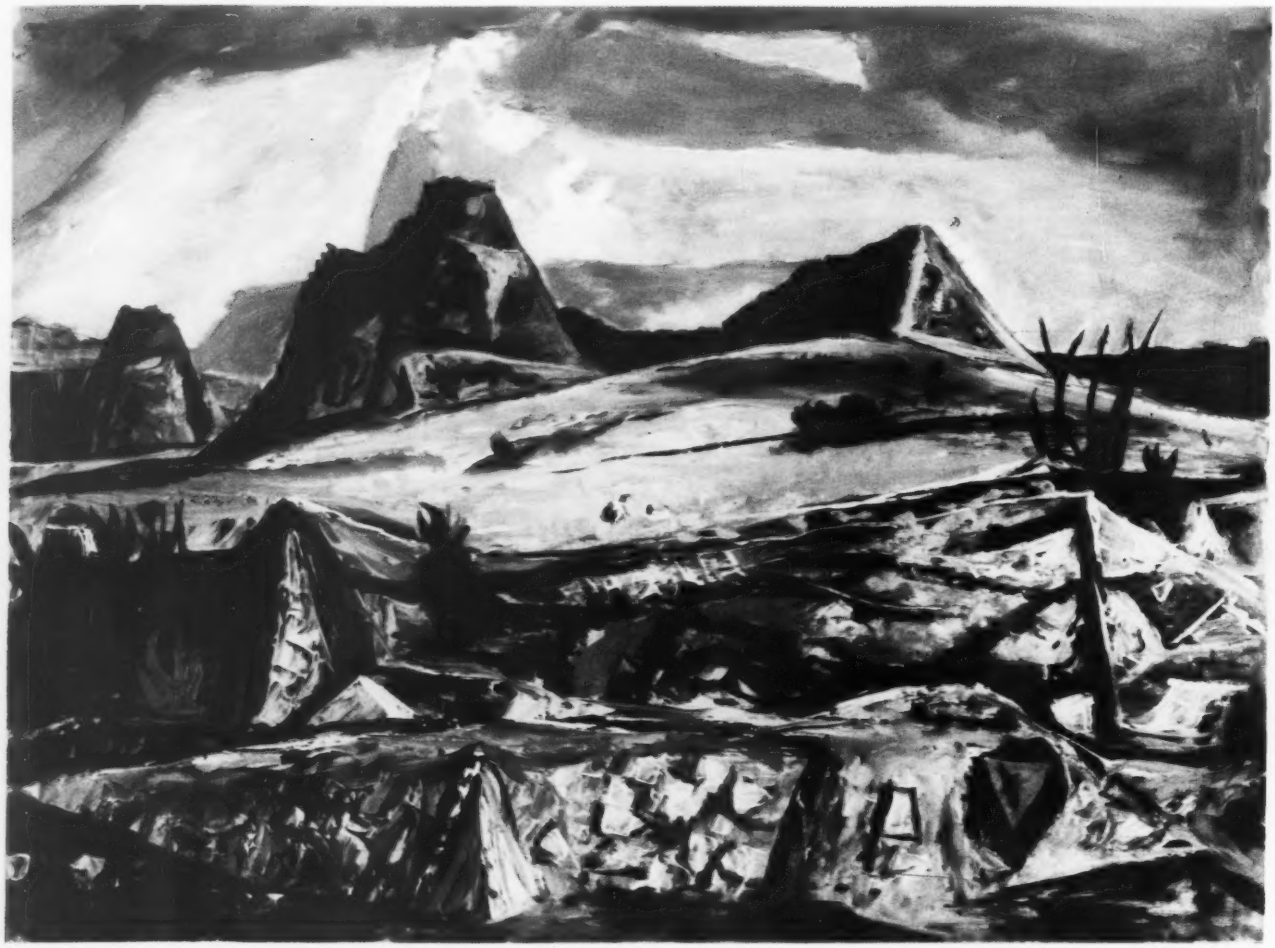
The Big Bend on Canvas

In an effort to present the rugged Big Bend National Park scene in broad artistic strokes, THE HUMBLE WAY brought together for this issue the work of four outstanding Texas artists. Three of the four—E. M. Schiwetz, Jerry Bywaters, and Otis Dozier—are native sons. Everett Spruce was born in Arkansas, but has lived in Texas for the past 20 years.

The three oil paintings reproduced on these pages and the watercolor on the cover were selected from the four painters' collections because they represent a variety of interpretations. The paintings differ materially in subject matter and technique and yet carry a striking similarity in brilliance of color and rawness of scenery.

Each of the four artists considers the Big Bend country a painter's paradise. Each has found on sketching trips such a wealth of sharp contrasts and such a tempting pattern of colors in the mountains and canyons and wastelands that the area remains always high on the list of "places to go when time permits."

Almost every Southwestern art show finds these four leading painters represented. All of them have had their work hung in galleries all over the nation; all have pictures in a number of private collections. (See Page 16 for biographical material.)



Where the Mountains Meet the Plains (Oil)—"The mountains, from the Big Bend to the Rockies, have always held a natural fascination for me because I have been a lifetime resident of the very flat prairie country. This painting is intended as a symbol of the fusion of the two patterns of regional life, as well as a painting of the two kinds of geography and geology."—***Jerry Bywaters.***

Big Bend Landscape (Oil)—"This picture was painted in 1947 from a pencil sketch made the same year at a spot somewhere along the road between Persimmon Gap and Hot Springs. The country looked good that day. I remembered what I liked most about the effect, and tried to get the feeling of weather and place into the painting."
—***Everett Spruce.***

Jack Rabbits (Oil)—"The Big Bend country, with its strange plant and animal life, is one of the most stimulating places I have ever sketched. I made this painting from memory several months after one of my sketching trips."
—***Otis Dozier.***

DOG CANYON MARKS the end of the Santiago Mountains and the beginning of the Dead Horse Range, stretching southward into Mexico. In this area Indians once hunted, Texas Rangers fought bandits, and cattle rustlers hid from the law.

(continued from Page 11)

Mine Peak, and vegetation becomes heavier. Juniper trees, pines, and tall century plants replace the scrubbier growth of the wastelands. The peaks, however, burst forth from the wooded slopes naked and sheer—volcanic rock as savage in form as must have been the heat and pressure which brought it forth ages ago.

Legendary Gold Mine

Lost Mine Peak actually hides a gold mine, if Big Bend legends are true. The mine was discovered, so this tale goes, by a band of Spanish explorers, but was sealed just before all perished in an attack by Apache Indians.

Although the story has attracted treasure hunters, the mine, if it exists, has never been rediscovered. Natives say its riches are eternally guarded from greedy hands by an Apache spirit, and to raise this legend to the stature of credibility they point out that when the sun sinks behind Pulliam, its eastern cliffs form a perfect Indian head in silhouette.

Driving upward, the vacationer may be startled by flag-tail deer springing from small draws and bounding across the road. Their white flag-like tails bob through the trees as they disappear down a canyon. These deer are numerous in the mountains, while the larger mule deer range the foothills.

At last the highest point of the road is reached, and below the traveler sees

FOUR OUTSTANDING TEXAS ARTISTS

E. M. Schiwetz, 50, was graduated from Texas A. & M. College with a Master's degree in Architecture in 1922. He has had no formal art education but has mastered almost every medium during his 25-year career in commercial and fine art. His watercolors have been in international shows and have hung in leading American galleries. His works have been displayed in one-man shows; have won him many prizes in Southwestern shows; and are held in private and museum collections. Schiwetz is a native of Cuero.

Everett Spruce, associate professor of art at the University of Texas, was born in Faulkner County, Arkansas, in 1908. He came to Texas in 1926, and studied at the Dallas Art Institute. Has been represented in more than a dozen national exhibitions; has had one-man shows in New York, California, and elsewhere; has won prizes in numerous competitions, the most recent being the Pepsi-Cola and La Tausca contests in the past two years. A large number of his oil paintings are owned by individuals and by museums and galleries.

Jerry Bywaters, 42-year-old native of Paris, Texas, graduated from Southern Methodist University, Dallas, and studied art in Europe, Mexico, and New York. He has exhibited at leading museums and galleries in the United States, including New York and San Francisco World Fairs. Has been awarded purchase prizes in a number of Southwestern shows, and is represented widely in museum, university, and private collections. He is associate professor of art at S.M.U., and director of the Dallas Museum of Fine Arts.

Otis Dozier, was born at Forney, Texas, in 1902. He received limited art education, but has taught painting for many years in Dallas, at the Colorado Springs Fine Arts Center, and at several universities during summer sessions. Has had one-man shows at New York galleries; is represented in private and public collections; has won large number of prizes, including Humble award at Texas General Show in Dallas in 1946. Artist Dozier is an instructor in the art department at Southern Methodist University, Dallas.

Cover Painting

"I chose this view of the Big Bend scene because of its tremendous feeling of space and primitive nature. The many shades of earth, arid types of shrubbery, and strong serrated lines gave a fine pattern. The little town of Boquillas, Mexico, on the white sands of the Rio Grande furnished a perfect focal point."

—*E. M. Schiwetz.*

For Information

Information on the park may be obtained from the Humble Touring Service or from Dr. Ross A. Maxwell, Superintendent, Big Bend National Park, Marathon, Texas.

Cabin reservations should be requested at least 30 days in advance from National Park Concessions, Inc., Big Bend National Park, P. O. Box 251, Marathon, Texas.

a wooded basin. As he winds his way down into The Basin, he finds there the small cabins and camp grounds for tourists.

Cabins for Tourists

In The Basin are 20 cabins capable of accommodating a maximum of 80 persons, and a cafe, store, and gasoline station. Sixteen of the cabins are plywood Army hutments, supplied with linen and blankets, kerosene lights and heaters, and fuel. Community bath houses are nearby.

The remaining accommodations are four stone cottages on the mountain side, which have private baths, fireplaces, and small kitchens equipped with kerosene stoves, cooking utensils, and dishes. The fireplaces are more useful than decorative; for although summer temperatures range from a maximum of 85-90 degrees to a minimum of 60-65 at night, winter days and nights may be quite cold.

A notch between Pulliam and Ward Mountains, called The Window, affords the only sight of the outside world from the mountain-ringed basin. Above towers Casa Grande, like a regal rock castle keeping paternal watch over man's frail structures below. Its vertical rock walls rise 7,300 feet above sea level; Emory Peak, 7,835 feet, is the highest mountain in the Chisos group.

Ghost or Indian Tribe?

Most residents of the Big Bend area say that "Chisos" is a Spanish word for ghost, and point to the weird shapes and eerie colors of the heights to bear out this contention. But the late Dr. Robert T. Hill, U. S. Geological Survey authority on Rio Grande canyons, left another story.

In 1901, after shooting the rapids and Big Bend canyons of the Rio Grande in a light boat, he was told by natives of the area that a small band of cannibal Indians once inhabited the mountains. These Indians, and later the mountains, were called Chisos. No proof of the story exists, however.

After feasting his eyes on the strange mountain scenery and becoming settled in his cabin, the visitor will probably tour other principal points of interest in the Big Bend. A drive westward through the park to Santa Elena Canyon and Terlingua, a round-trip distance of 84 miles, is a full day's travel.

The way leads through typical badlands again, skirting the Chisos toward the Rio Grande. Atop Burro Mesa, the tourist may see several wild burros, descendents of animals which strayed from Spanish herds more than 100 years ago. They pause in their grazing to stare warily at the passing automobile.

Mayor of Alamo Wash

Near the Rio Grande the gravel road turns through Alamo Wash, a wide shallow stream bed. Close by lives Gilberto Luna, 107-year-old Mexican goat herder, in an adobe-plastered stone and brush hut. As patriarch of the area, he has been allowed to remain in the park, and friendly Rangers have bestowed upon him the title of "Mayor of Alamo Wash."

Several children and grandchildren live with him, and all exist on the corn, chickens, and animals he raises plus the park's edible yucca blossoms, mesquite tree beans, prickly pear joints, and cactus fruit.

The barren landscape continues almost to the very banks of the river, where the road emerges near the canyon mouth.

Santa Elena Canyon is a deep gash carved through the limestone of the Mesa de Anguila by ages of Rio Grande water. Typical of the three Rio Grande canyons in the park and the only one easily accessible, its vertical walls rise 1,516 feet above the river, with rust, copper, blue, and green colors betraying the presence of different minerals in the limestone. At times there is so little water flowing between its walls the vacationer can leap from the United States to Mexico, but normally it is a wide and shallow but rapidly flowing stream. Near the canyon entrance is a camping ground, and swimming and fishing are permitted.

Deserted Mining Town

To reach Terlingua from this point, the tourist must retrace his steps some 12 miles and turn onto the road to Alpine. On the way the road passes iron-red Maverick Mountain and the few adobe buildings of Study Butte, where gasoline and groceries may be purchased.

A deserted quick-silver mining town, Terlingua is located outside the park boundaries. Before and during World War II its mines were producing, and numerous Mexican laborers lived near the shafts in adobe houses. Shortly after the war, however, a combination of water in the shafts and falling mercury prices forced abandonment of the mines.

Although a few Mexican families remain, most buildings are empty and tumbling down. Their adobe roofs and walls appear to have crumbled away through the ages, though deserted only a short time. Their ruins are explained, however, by the fact that laborers were given anything they could use from the houses when the mines closed. They promptly ripped out all ceiling timbers, window frames, and doors, packed them with their belongings, and departed. Even the roof and front of the adobe theater is missing.

The area surrounding Terlingua is ranchland, and will support one steer to a minimum of 100 acres. "Terlingua" means three languages — Spanish,

English, and "Texan," according to ranchers of the area.

Hot Springs Interesting

Another day, the tourist may visit the opposite side of the park to see Hot Springs and Boquillas Canyon, located on the Rio Grande at the eastern edge of the river's Big Bend. Near Hot Springs, the road divides into two pairs of ruts, winding tortuously around low, chalky hills to the little settlement.

Hot Springs was named for a hot mineral spring on the edge of the Rio Grande, which now bubbles through a small stone bath house. Its waters are said to be very healthful.

The settlement consists of a store, house, and six tourist cabins, operated by Mrs. Maggie Smith, who is emergency doctor, translator, cook, and hotel keeper. The buildings have no electricity or plumbing.

Toward Boquillas, a short distance down the river, the vacationer catches sight of box-like adobe houses in the quaint Mexican village at the foot of shimmering Sierra del Carmen Bluff across the Rio Grande. The black and purple cliff, several miles long, marks the western heights of Sierra del Carmen mountain range. Boquillas Canyon, very like Santa Elena Canyon, opens near the village.

Chisos Form Backdrop

The Chisos Mountains again dominate the scene on the return trip to park headquarters; their purple heights on the horizon make a breath-taking backdrop for the drab badlands, the desert plant life, and the winding, dipping road.

These extreme contrasts flash again and again through the tourist's mind as he packs his automobile and leaves the Big Bend National Park. And looking over his shoulder for the last time at the jagged Chisos, he is amazed anew at the variety of the Texas scene — that these primitive mountains should be part of the Lone Star State.

THE WINDOW, top, is a gap between mountains surrounding The Basin. It affords only glimpse of the outside world from Big Bend headquarters. Below is Green Gulch, through which passes the only road into or out of the rugged Chisos Mountain sector.

TEXAS' DEEPEST PRODUCER at this time is Humble's South Mayes Gas Unit I, No. 1, producing from 12,021 to 12,026 feet.

Located approximately two miles from the South Mayes field in Chambers County, it is in an area where some of the highest subsurface pressures along the Gulf Coast have been encountered. The well is about 3,000 feet from the Lula Wallis 2, which blew out in August, 1947. The high pressure stratum which blew out was not drilled into, however, as returns were lost when the mud weight reached 16.3 pounds per gallon.

The independent drilling contractor who drilled the well for Humble encountered no unusual difficulties. Drilling progress was fairly steady, 34 feet being the average daily progress below 10,000 feet. 161 days were required to complete the well, of which drilling and round trips consumed 84.5 days. Conventional and sidewall coring required 23 days.

On the initial production test, the well flowed at the rate of 134.4 barrels of condensate per day, and produced 1,344,000 cubic feet of gas per day, through a one-eighth inch choke. Tubing pressure, flowing, was 5,500 pounds per square inch. Shut-in pressure was 6,300 pounds per square inch. The well is shut in at present, awaiting surface production equipment.

The mud pumps had been removed to a new location when this photo was made.

DR. EDWARD H. MARTIN examines employee while Division Field Nurse Lillie Pearl Dodd sterilizes instruments in the mobile unit's spotless, completely-equipped medical examining room.

CLINIC ON WHEELS

Traveling medical unit will provide complete Physical examinations for employees in the field

Efficient employees are essential to the success of any business, and good health is a prime requisite for contentment and efficiency. For these reasons, industry attempts to promote high standards of health among employees, and Humble Oil & Refining Company's progressive Medical division, through preventive medicine, bends every effort to that end.

That "good health is good business" is a belief long held and practiced by Humble.

The Company's Medical division offers a wide range of services, and covers a geographical territory just as wide—from the prairies of New Mexico to the Everglades of Florida.

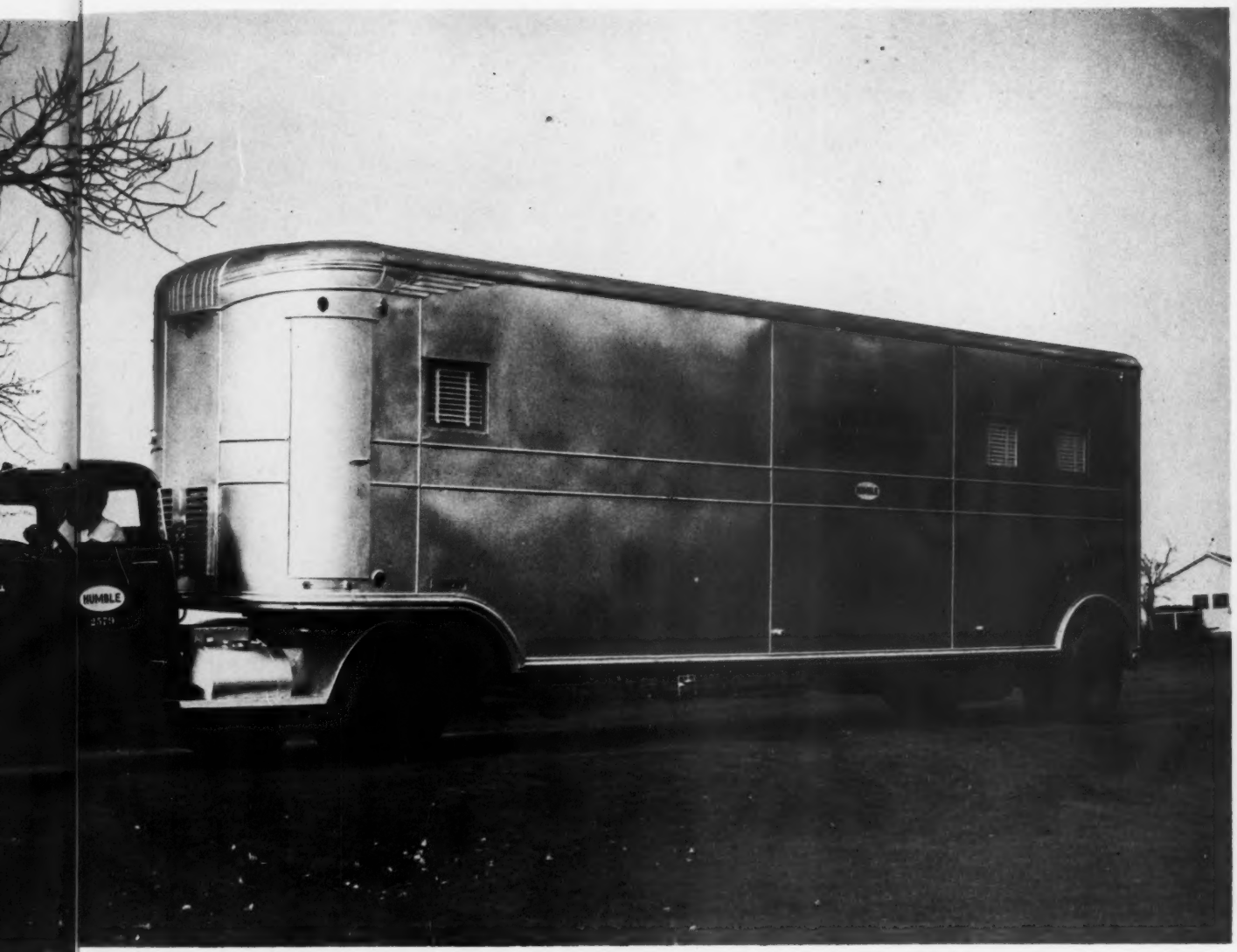
To offer improved medical service to approximately 7,500 field employees in that tremendous area, Humble last month rolled out its newest piece of equipment—a mobile medical unit.

A complete, compact, clinic-on-wheels, the mobile medical unit will make continuous tours of the highways and byways of Humble's operating territory to offer free voluntary periodic physical examinations to all field employees. It will visit Production department and Pipe Line Company employees in more than 300 field camps, refinery employees at the San Antonio plant, Company sales personnel in Texas cities, and exploration crews wherever they may be operating.

The Medical division estimates that about a year and a half will be required for the examining unit to make its first complete field tour; after that it will begin making return visits.

Periodic physical examinations for employees has been a function of the Medical division for many years, and prior to World War II such examinations were given in the field by a traveling physician with portable equipment. The mobile medical unit was constructed to make more complete diagnostic equipment available to the traveling doctor, and with the hope that such ailments as might exist could be discovered early enough for easy cure.

The Medical division emphasizes that the services of the mobile medical unit are wholly voluntary; that a complete examination is made and the results given to the employee but not to management; and that all records made and conversations between the doctor and the employee are strictly personal, confidential, and professional. Only at the employee's request, or with his permis-



MOBILE MEDICAL UNIT ARRIVES AT CHILTON PUMP STATION TO OFFER FREE, VOLUNTARY PHYSICAL EXAMINATIONS.

sion, is any of the information developed from the examination given to management.

The unit will perform diagnosis only, and if any ailment is found, the employee will be referred to other physicians for treatment. Along with the new uniform hospitalization insurance program, which became effective February 1, the mobile medical unit rounds out one of the nation's best industrial health programs for field employees.

The new traveling clinic is housed in a trailer van 34 feet long, 11 feet and 10 inches high, and eight feet wide—one of the largest mobile medical units ever built. It is pulled by a truck-tractor, and has an overall length of 44 feet and six inches.

The trailer is divided into three sections. A small, gleaming laboratory is built into the trailer's forward end, and is equipped to perform almost all types of tests necessary to diagnostic medicine. Facilities of this type are often not available near field camps. The black-walled X-ray room in the vehicle's mid-section is fitted with complete X-ray equipment, dark room for developing X-ray pictures, fluoroscope, electro-cardiograph for recording heart action, and an eye-testing machine.

The rear section of the trailer is a doctor's examining room, fitted with desk, examining table, sterilizers, and lights and fixtures. All equipment is installed to stand road shocks.

Dr. Edward H. Martin, who is especially well qualified in the field of medical diagnosis, is in charge of the unit. Thomas Beckham, X-ray technician, is the other staff member. Whenever possible division field nurses accompany the unit on all stops in their division.

The trailer is equipped with transformers which enable it to be tied into electric power wherever it stops. It is fitted with electric lights, refrigeration, and air conditioning and heating equipment. Every inch of space is carefully utilized—the trailer's "attic" contains a fifty-gallon water tank.

Another good health service—that is Humble's new mobile medical unit.

1. THOMAS BECKHAM, X-ray technician aboard Humble's new traveling clinic, examines specimen of blood in the compact, gleaming laboratory.

2. LOOKING FORWARD through the long trailer-clinic, staff members are seen at their jobs. Beckham performs a specimen test in

Bringing preventive medicine to 7,500

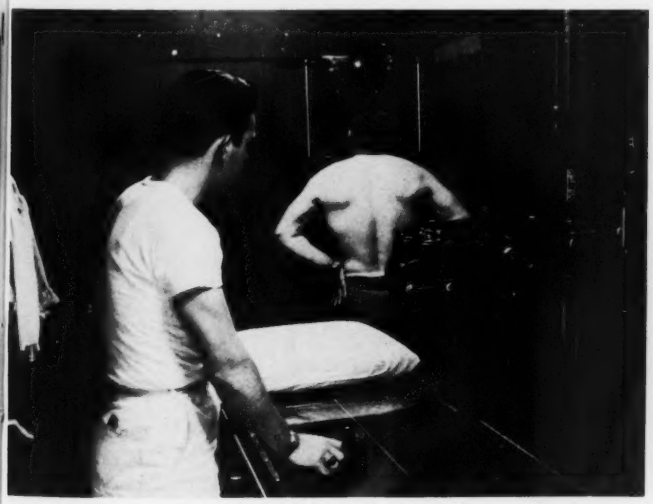
4. DUDLEY L. TANKERSLEY, Humble Pipe Line employee at Chilton Pump Station, answers questions for strictly confidential medical history.

5. TANKERSLEY BEGINS physical examination with visual test. Nurse records reactions as he peers into an eye-testing machine.

the lab as Nurse Dodd takes an employee's blood pressure. Dr. Martin inspects clinical history and records made in previous examination.

3. WELCOME! SAYS NURSE Dodd to these Chilton Pipe Line Station employees, checking in at the traveling clinic for physical examinations.

7,500 field employees in Gulf Coast States



6. Unit technician next makes chest X-rays for employee, and any other X-ray pictures doctor may request for completing exam.

7. TANKERSLEY RELAXES while electro cardiograph machine is used to record his heart actions. Last, he will be examined by Dr. Martin.

OIL AND WATER DON'T MIX

(Continued from Page 8)

the Humble product in a score of fields over a period of months. Finally, the management decided to manufacture a line of emulsion breakers to be sold under the appropriate name of Breaxit.

The pattern established by the Oklahoma experiment has been faithfully followed. Research has been continuous, in field as well as laboratory. Service goes to the lease; Breaxit engineers make their recommendations based on tests of live oil at the spot where the emulsion breaking compound is put into the oil. New compounds are developed, tested, marketed; old compounds are improved. The idea is to secure pipe line oil—as free of water as practical—from the emulsion that flows from the well at the lowest possible treating cost. Active competition keeps the entire Breaxit organization on its toes and eager, for Humble's Production department, like the industry generally, must break its emulsions with the best compound available to it; sometimes the best chemical compounds for certain emulsions are manufactured by competitors. And since all compounds now on the market are patented, research is stimulated to find entirely new and better, patentable compounds.

The basic ingredients of all the Breaxits still come from Baytown refinery. They are shipped from Baytown to the Specialty Manufacturing department at Houston, where the Breaxit laboratory and Blending Plant are located. There they are compounded with certain chemicals and hydrocarbon synthetics to make the various Breaxits. The laboratory performs the dual function of research and control of manufacture. At present, there are about 100 Breaxit compounds on the market, but the number doesn't mean very much, for the list is subject to almost continuous expansion and contraction as products are improved and new products developed. Compounding and addition of synthetic material has opened up what amounts to a whole new family of Breaxit compounds.

One may wonder why samples of the emulsions to be broken coudn't be sent to the laboratory at Houston for tests and recommendations. The answer is, the character of the emulsion often changes en route, and the Breaxit compound that might do a fine job in the laboratory might prove unsatisfactory at the well.

ENGINEER POINTS OUT effectiveness of one type of Breaxit in breaking up emulsions in oil produced from wells serving tanks in background. Lab expert, right, holds bottle of untreated oil.

Traveling Laboratories

So each Breaxit engineer drives an automobile that, for his purposes, is a mobile laboratory. It is equipped with (1) a complete set of Breaxit compounds to be tested on live oil emulsions; (2) a set of the chemicals sold by competitors; (3) a case of graduated pipettes for accurate measurement; (4) three or four cases of graduated 100 cc bottles; (5) a gasoline stove for heating the emulsion when necessary; (6) a small centrifuge; and (7) assorted odds and ends of testing equipment that each individual carries as his experience indicates their necessity or convenience. With this equipment, he will test a large number of Breaxits on an emulsion at a time, and in some cases, he may test several such groups, finally reducing the test to a comparison of the best results in each group, until he can select one Breaxit that is best suited to handle that particular emulsion treating problem.

To make the test, he fills a bottle with a sample of the emulsion taken from the flow line. Using a pipette, he adds an exact amount of a Breaxit compound. Then he shakes the bottle thoroughly. If heat is used on the lease, he heats the treated emulsion. Then he records the time required to break the emulsion so that there is a clear line of demarcation between the water and the oil. Finally, he carefully takes a sample of the oil, and centrifuges it to find out how much basic sediment and water is still in it; this must not exceed one per cent and should be less. All the data from each test are carefully recorded.

It is a lengthy process that sometimes requires two or three days to complete. Then, if the compound selected does the job expected of it efficiently and economically in actual use, its use is continued.

Like the emulsions to be broken, the methods of applying Breaxit to the oil vary from lease to lease, depending upon how the wells are produced. At one point, flow lines from a group of wells may end in a manifold that feeds a single separator. The Breaxit is pumped into the line beyond the manifold in quantities which may vary anywhere from one part in 5000 to one part in 50,000. It passes with the oil-water mixture through the separator and into a flow treater or gunbarrel, where the emulsion is usually heated to 100-150 degrees Fahrenheit. There the emulsion is broken, and the oil drawn off at the top, the water at the bottom.

Some Emulsions Hot, Some Cold

Or a single well may be treated by pumping Breaxit into the flow line at the well head, to go with the emulsion through the separator into the treating plant. Some emulsions are hot, some are so cold that they freeze the condensed moisture on the flow lines. Some contain as much as 80 per cent of water. The usual emulsion of water in oil (like butter) is easier to break than an emulsion of oil in water, called an "inverse emulsion." Salt water emulsions are generally easier to break than fresh water emulsions. The longer the Breaxit is in the flow line with the emulsion, the better the results obtained in most cases: a well on Redfish Reef in Galveston Bay produces a particularly difficult emulsion, but because the Breaxit travels with the emulsion a distance of approximately 10 miles through the flow line, only one part of Breaxit is required to 50,000 parts of emulsion; a neighboring well produces the same type of emulsion but the treated oil travels such a short distance that one part of emulsion-breaking compound to 12,000 parts of emulsion is required.

More Oil With Breaxit

The unprecedented demand for oil during and since World War II has focused the industry's attention on another type of emulsion. This type is found in the bottoms of storage tanks and is called "tank bottoms." These vary in character from a slushy emulsion, similar in texture to some live oil emulsions, to emulsions of very heavy consistency. Tank bottoms have always been a problem for the industry because they not only occupy needed tank storage, but also create a tank cleaning expense, particularly in the large tank farm storage tanks. If the oil from such bottoms cannot be salvaged, it has to be burned. During the war, some of the tank bottoms which were treated with Breaxit compounds were 40 and 50 years old. Oil obtained from these bottoms was a small but helpful addition to the U. S. wartime production. An extremely valuable by-product of some tank bottoms is a micro-crystalline wax used in coating waxed paper of the sort used for bread wrappers.

The selection of a Breaxit compound for use on tank bottoms does not require the field service testing which must be made on live oil. The emulsions are so old that they are fairly stable in character, and samples can be shipped to the laboratory at Houston. Most of the work of breaking the emulsion and recovering the oil is generally done by contractors, who sometimes work for a fixed fee, sometimes on a cost-plus basis, and occasionally under an arrangement whereby the contractor cleans the storage tanks in exchange for the oil he recovers. Equipment generally includes some apparatus for both heating and agitating the emulsion after addition of Breaxit.

Typical of Industry

The story of the development of Breaxit is in miniature the story of the oil industry generally. It is a story of original research to solve a specific problem, the adaptation of the solution to other problems, and the development and improvement of processes under the spur of competition. And the end result has been a saving of some millions of dollars in the production and recovery of crude oil, a saving which is felt by the ultimate consumer of petroleum products in the reasonable prices he pays for them.

LEASE PUMPER checks for basic sediment and water in a container of oil which has just been run in a centrifuge. Breaxit breaks up emulsions, makes oil acceptable for delivery.

By the way . .

Appointed N. A. M. Chairman

Executive Vice President Hines H. Baker early in April was appointed chairman of the National Association of Manufacturers' consolidation program for 1948. In accepting the chairmanship, Mr. Baker said: "The new consolidation program, which unifies all support of the N. A. M.'s efforts, will not only strengthen the organizational structure of the N. A. M., but will in effect bring about a broader understanding of what N. A. M. stands for; that is, an America which continues to foster and encourage individual initiative and free competitive enterprise through which our people have developed a social economy with the highest living standards the world has ever known and a measure of general well-being unparalleled in history."

They Have Retired

During the past two months 11 members of the Humble family have left their daily tasks behind to enjoy the benefits of the Company's Annuity plan.

ARTHUR B. MARTIN, mixer man at Baytown refinery, retired on January 22 . . . WILLIAM CLEMENS, handy repairman at Baytown refinery, on January 29 . . . DAVID M. BEARD, engineer at several Pipe Line Company stations during his 28-year career, on February 1 . . . OSCAR L. NELSON, separator pumper at Baytown refinery, on February 28 . . . MARION F. RILEY, roustabout gang pusher at Raccoon Bend, on February 29 . . . WALTER J. JONES, engineer at Station B on the West Texas pipe line, on March 4 . . . LUTHER W. MCCLURE, SR., lease pumper-gauger at London, on March 6 . . . WALTER M. LOONEY, pumper at Avoca, on March 8 . . . WILL HODGES, SR., laborer at Baytown refinery, on March 16 . . . OBE D. ECHOLS, water pumper at Baytown refinery, on March 22 . . . and NEWT BRASHER, roustabout at Goose Creek, on March 27.

Deaths

During the past two months death has claimed eight employees of the Humble Companies and five who had been in the ranks of retired employees for some years.

ABE MC BROOM, 28, roustabout at London, died on February 9 . . . ANDRUS J. BAY, 52, operating chief engineer at Hull Station, Humble Pipe Line Company, on February 7 . . . EDGAR E. MOYER, 47, first class repairman at Tomball Gas Plant, on February 14 . . . PERRY J. WILLIS, 50, lease pumper-gauger at North Crowley, Louisiana, on March 1 . . . WILLIAM P. KUNEFKE, 49, truck salesman at Winnie bulk station, on March 4 . . . GROVER C. MEADOR, 59, lease pumper-gauger at Tomball, on March 5 . . . CHARLES R. SMITH, 52, engineer at London Gasoline Station, on March 7 . . . and MARK C. DICKERSON, 41, claim and right-of-way man for the Pipe Line Company at Longview, on March 24.

Annuitants who have expired during the past three months are: ROGERS HOBBS, laborer at Baytown refinery until his retirement on February 7, 1947, died on January 30 of this year . . . WILLIAM N. BOLIN, pumper at Goose Creek prior to his retirement on December 1, 1936, on February 8 . . . LAWRENCE H. WEST, storehouse clerk at Baytown refinery prior to retirement on July 9, 1946, on March 6 . . . JOSEPH A. PURSIAN, lease pumper-gauger at London before retiring on March 8, 1944, on March 26 . . . and ALEX D. MURPHREE, pumper at Humble until his retirement on January 13, 1937, died on March 30.

The HUMBLE WAY

MARCH-APRIL, 1948

Vol. III Number 6

$140 Million Investment in '48..... 1

A Day on a Rig..... 2

Oil and Water Don't Mix..... 6

Can This Be Texas?..... 9

The Big Bend on Canvas.....12

Texas' Deepest Producer.....17

Clinic on Wheels.....18

By the way.....24

Published every other month for employees and stockholders

HUMBLE OIL & REFINING COMPANY

P. O. BOX 2180, HOUSTON 1, TEXAS

BOARD OF DIRECTORS

H. C. WIESS — D. B. HARRIS
HINES H. BAKER — J. A. NEATH
L. T. BARROW — REX G. BAKER
DAVID FRAME — H. W. FERGUSON

OFFICERS

H. C. WIESS, *President*
HINES H. BAKER, *Executive Vice President*
L. T. BARROW, *Vice President*
DAVID FRAME, *Vice President*
D. B. HARRIS, *Vice President and Treasurer*
J. A. NEATH, *Vice President*
REX G. BAKER, *General Counsel*
H. K. ARNOLD, *Secretary and Assistant Treasurer*
GAY CARROLL, *Comptroller*

Permission for reproduction of articles and pictures contained herein will be granted freely if credit is given and the request is made of the Editor, THE HUMBLE WAY, P. O. Box 2180, Houston 1, Texas.

SKILL AND TIMING are required of the derrickman on the thribble board as he leans into his safety belt to rack pipe during a round trip. (See *A Day on a Rig*, Page 2.)

PROGRESS *with* PETROLEUM

Greyhounds of world commerce, the Clipper ships of a century ago were the pride of seagoing men. But today's steel giants of the sea lanes, petroleum-fueled steam and motorships, speed vastly greater cargoes to world ports in much shorter time. Petroleum has revolutionized the design and operation of fighting ships and cargo carriers in the past four decades.